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**(54) Title:** ANTIPERSPIRANT PADS

**(57) Abstract**

The present invention relates to antiperspirant pads comprising an active ingredient releasing formaldehyde in neutral or acidic medium. The pads are impregnated with hexamethylenetetramine in the form of an aqueous suspension containing in addition to the active ingredient binding agents, water and optionally skin structure improving agents and/or agents alleviating burning or itching, disinfectant, preserving agent and/or astringents.

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## ANTIPERSPIRANT PADS

The present invention relates to antiperspirant pads impregnated by an active ingredient showing desodorant, antiperspirant and antiseptic activity. The antiseptic activity can be observed not only on the foot itself but in the footwear as well.

Perspiration serving for the control of the temperature of the body is within certain limits a natural process, but over perspiration has to be dealt with.

10 The smell of the fresh perspiration can not really be felt, i.e. the unpleasant smell accompanied by over perspiration is not the original smell of native perspiration, but is due to the enzymatic decomposition of materials accumulated on the skin surface, such as tissue debris, tallow, keratin, high molecular fatty acids as a result of the activity of parasitic bacteria and fungi. The over perspiration in most cases is limited to certain parts of the body, such as feet, hands, arm-hole etc. The above mentioned decomposing materials are suitable media for the proliferation of bacteria and fungi and they may infect the perspiring skin surface as well. This may be particularly the case for perspiring feet, as in the relatively closed shoes the foot and the footwear may be infected easily.

25 Consequently the foot may be infected with a mycotic infection and dermatitis may occur. Due to the fact that the inside of the shoes cannot be easily kept clean or disinfection thereof is complicated repeated infections may occur.

30 Antiperspiration methods known so far have mainly been various paintings, powders, creams and sprays. In István Inzelt: Vegyi Receptek, 3. edition Chapter Antiperspirant agents, Műszaki Kiadó p. 765 (1967) an antiperspirant cream is disclosed which contains hexamethylenetetramine as active ingredient and the desodorant activity is ensured by the composition according

to the extent of perspiration.

The disadvantage of this cream however is similarly to the other creams, powders, paintings and sprays used so far is that due to the periodic character of their use, the treatments have to be repeated at least every day, as they are wiped off or washed off the skin surface, their action is therefore short, their use requires much time and is complicated and the effective disinfection of the footwear is not solved. Their addition is dependent on the method of use and on the circumstance, how often it is used. The effect thus is far from optimal.

Overdosage may result in tanning of the skin, under dosage may not achieve the desired effect. The powders may block the pores and the creams may inhibit the free ventilation of the skin.

The disinfection of the footwear is not or only partially solved.

In C.A. 89 94 881a [Farm. Vestn., 28/4 p 301-303 (1977)] the use of a new pad is suggested which is impregnated with basic aluminium chloride ( $Al_6(OH)_5 \times 2-3 H_2O$ ) combined with a foot cream containing a bactericide called Irgazan DP 300, menthol, and as an emulsifier polyoxyethylene sorbitan monolaurate (Tween 20). Although this process solves the disinfection of the foot and also inhibits perspiration the disinfection of the footwear is only partially solved, only where the footwear is in contact with the cream and also other problems mentioned for the use of creams are not eliminated.

The present invention is directed to a product without the mentioned disadvantages, with the aid of which the treatment is simplified, the disinfection of the footwear is also solved and the effect is long lasting and optimal.

We have now surprisingly found that by impregnating pads with a special composition releasing desodorant and disinfecting gas the foot to be treated is surrounded by

said gas ensuring thus the desired effect both on the foot and in the footwear.

The pad according to the present invention contains hexamethylenetetramine as active ingredient releasing  
5 formaldehyde in neutral and acidic medium as known from the literature according to the following equation:  
$$/CH_2/6N_4 + 6 H_2O + 4 C_3H_7-COOH = 6 HCOH + 4 C_3H_7-COONH_4$$

Hexamethylenetetramine used so far has not released any gas in lack of surroundings inducing the gas evolution. The weak acidic character of perspiration is due to the fatty acids and uric acid contained in it. The reaction is started by the perspiration being absorbed into the pad. When the perspiration is ceased the formation of formaldehyde is also ceased. If perspiration occurs  
15 again, the pad absorbs it, initiating the reaction again and thus the system becomes self-controlling, over dosage is excluded. The activity of the active ingredient itself is not drastic as it is known to be innerly used for disinfection of the urinary tract. The activity of hexamethylenetetramine itself is not bactericidal only bacteriostatical until as a result of perspiration the highly bactericidal formaldehyde is not released therefrom. The formed formaldehyde gas fills in the space being at its disposal and establishes an intimate contact with the  
20 foot and the footwear resulting in a more intensive disinfecting effect than that of other bactericides.

Simultaneously the skin is dried, tanned and desodored, the tissues are fixed and preserved by being bound to the free amino groups of the proteins and the toxines  
30 are converted to non-toxic toxides.

The pads according to the present invention are impregnated with an aqueous suspension containing hexamethylenetetramine as active ingredient and cellulose ether, such as methyl cellulose or carboxymethyl cellulose as suspending or binding agent.  
35

The present invention extends to this aqueous suspen-

sion as well. The aqueous suspension may optionally contain other components as well, such as menthol as refreshing agent, salicylic acid for alleviating itching or burning and serving also as disinfectant or preservative, and zinc oxide and/or kaolin due to their astringent property, or starch and kaolin as binding material latter being used as adsorbent as well, and other skin structure improving substances, such as glycerol and water.

10 The aqueous suspension may contain e.g. the following components : 0.1 to 45 % by weight of hexamethylenetetramine, 0.1 to 15 % by weight of cellulose ether and water up to 100 % by weight and optionally 0.1 to 30 % by weight of glycerol, 0.01 to 5 % by weight of salicylic  
15 acid, 1 to 30 % by weight of kaolin, 0.1 to 4.5 % by weight of zinc oxide, 0.01 to 0.5 % by weight of menthol.

The pads according to the present invention can be prepared as follows: A suspension of the above components is applied to the pad. The active ingredient is dissolved  
20 in 2/3 of the water and the cellulose ether is dissolved in 1/3 of the water and the insoluble powdery components optionally together with glycerol are added. The two liquids are combined under stirring and homogenized. The pH of the mixture is adjusted to 7 by adding acetic acid.  
25 The pads are immersed in the suspension and after a few seconds they are taken out from the suspension and strained off.

The excess is pulled off by a suitable tool. The duration of the immersing and the thickness of the suspension is chosen to ensure that 5 to 10g of dry substance  
30 are added to each pad. The pads are cautiously dried (max. 60 C) and packed. Pads are prepared of Vlies (felt impregnated with latex and prepared of polyester and viscose fibre).

35 The absorbtivity is about 5 times higher than that of natural leathers. The pad thus prepared when placed in

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the footwear is already suitable for treating the perspiring foot.

Further details of the above invention can be illustrated by the following non limiting Examples. Pads of  
5 the following composition can be prepared:

Example 1

Components	% by weight
hexamethylenetetramine	3.86
10 menthol	0.30
salicylic acid	3.00
zinc oxide	0.60
kaolin	13.00
methyl cellulose	0.75
15 glycerol	23.00
water	up to 100 %

Example 2

Components	% by weight
20 hexamethylenetetramine	10.00
menthol	0.02
salicylic acid	0.13
kaolin	10.00
carboxy methyl cellulose	1.45
25 glycerol	5.00
water	up to 100 %

Example 3

Components	% by weight
30 hexamethylenetetramine	38.00
menthol	0.02
salicylic acid	5.00
kaolin	1.20
methyl cellulose	3.00
35 glycerol	1.00
water	up to 100 %

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CLAIMS

1. Antiperspirant pads comprising an active ingredient releasing formaldehyde in neutral or acidic medium.

5 2. Antiperspirant pads as claimed in claim 1 characterized in that they are impregnated with hexamethylenetetramine.

3. Antiperspirant pads as claimed in claim 1 or 2 characterized in that the hexamethylenetetramine active  
10 ingredient is in an aqueous suspension.

4. Aqueous suspension for use to prepare antiperspirant pads as claimed in any of claims 1 to 3 characterized in that they contain in addition to the active ingredient binding agents, water and optionally skin structure improving agents and/or agents alleviating burning or itching, disinfectant, preserving agent and/or adstringents.  
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5. Aqueous suspension as claimed in claim 4 characterized in that it contains 0.1 to 45 % by weight of hexamethylenetetramine.  
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# INTERNATIONAL SEARCH REPORT

National Application No  
PC., HU 95/00063

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A61L9/04 A61L9/01 A61K7/32

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO,A,95 22309 (DEN ELSHOUT WILHELMUS HENDRICU) 24 August 1995 see claims; example	1-5
X	FR,M,8 299 (INVESTIGATIONS SCIENTIFIQUES PHARMACEUTIQUES S A) 16 November 1970 see the whole document	1-5
X	US,A,4 202 882 (SCHWARTZ HERBERT) 13 May 1980 see claims; examples 1-19	1-5
X	FR,A,2 443 838 (SIMOVIC RASTKO) 11 July 1980 see claims	1,2
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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## INTERNATIONAL SEARCH REPORT

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR,A,2 302 083 (HLAVIN ZISKA) 24 September 1976 see claims; examples 1-3 ---	1,2
A	US,A,4 311 512 (SCHWARTZ HERBERT) 19 January 1982 see column 3, line 4 - line 23; examples ---	1-5
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